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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,705	04/13/2004	Takashi Yoshitomi	251683US2S DIV	2929
22850	7590	08/11/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			NHU, DAVID	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/822,705

Applicant(s)

YOSHITOMI, TAKASHI

Examiner

David Nhu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/178,019.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTIONS

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Background of Invention (BOI) in view of Lee et al (6,509,601 B1), Kim (6,204,070 B1).

Regarding claim 11, see BOI, (see figure 16, pages 1-3), teaches a method of manufacturing a semiconductor device comprising a capacitor 120 which has a first electrode film 116, a second electrode film 119 being provided above the first electrode film, and a capacitor insulating 117 provided between the first and second electrode films, said method comprising: forming an insulating film 122 on the capacitor 120; forming a first trench 125a configured to expose a part of the first electrode film 116, and a second trench 125b configured to expose a part of the second electrode film 119; forming in the first trench a first connection part electrically connected to the first electrode, and forming in the second trench a second connection part electrically connected to the second electrode film.

BOI fails to teach forming a protective insulating film between the capacitor insulating film and the second electrode film or the second electrode film; performing heat treatment which uses a hydrogen containing gas.

However, Kim, (see figures 1, 2C, col. 3, lines 10-67, col. 4, lines 1-49), teaches forming a protective insulating film between the capacitor insulating film and the second

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electrode film or the second electrode film; performing heat treatment which uses a hydrogen containing gas (see col. 4, lines 38-44).

Also, Lee, (see figure 2E, col. 14, lines 10-42, col. 24, lines 40-54), teaches forming a protective insulating film between the capacitor insulating film and the second electrode film or the second electrode film; performing heat treatment which uses a hydrogen containing gas.

Regarding claims 12-26, see BOI, pages 1-3, Kim, col. 1-8, Lee, col. 1-36, also teach, forming a first wiring trench and a second wiring trench before the heat treatment is performed, said first and second wiring trenches continuing with the first and second trenches; and forming a first wiring and a second wiring in the first and second wiring trenches, respectively, at the same time the first and second connection parts are formed (see BOI, figure 16); the protective insulating film is aluminum oxide, tantalum oxide, and has relative dielectric constant, a thickness range; the capacitor is formed on a diffusion protecting film; the first and second wirings are formed copper; the first and second electrodes are formed of a titanium nitride; wherein the protective insulating film prevents reducing of the capacitor insulating film; the capacitor insulating film is in contact with the first and second electrodes.

It would have been obvious to one having ordinary skill in the art to apply the teachings of Kim and Lee into the disclosed method of BOI as they are related to the same subject matter of fabricating a MIM capacitor, capable of preventing the hydrogen gas generated in the process

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Lee'601, Kim'788, Stauf'7086 are cited as of interest.
4. A shortened statutory period for response to this action is set to expire 3 (three) months

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and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see 710.02 (b)).

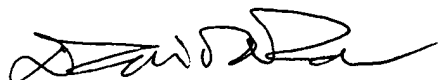
5. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu, (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the patent application information retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Nhu



August 10, 2005